

### **REMARKS**

The Applicants wish to thank the Examiner for his review of the present application. In the present response, Applicants have amended claims 12-13, 89-92, 99, 101-102, 104, and 123-126, and added new claims 173-184. Applicants previously withdrew claims 1-6, 9-10, 14-55, 106-115, and 131-172 and previously cancelled claims 7, 8, 11, 56-88 and 100.

At this time, claims 12-13, 89-99, 101-105, 116-130 and 173-184 are pending in the application. No new matter has been added.

### **Amendments to the claims**

Claims 12-13, 89-92, 99, 101-102, 104 and 123-126 have been amended

Claim 12 has been amended to cite “extracting a trabecular pattern from the region of interest; and generating a data structure representing the trabecular pattern”. Support for these elements can be found in several places in the specification including at paragraphs 51, 54, 55, 66, 68, 69 and 80.

Claim 13 has been amended to change dependency and to correct a typographical error by deleting “total” and replacing it with “trabecular”.

Claims 89-92, 99, 101-102, 104 and 123-126 have been amended to conform these claims to the amendments of claim 12.

### **35 U.S.C. §112**

The office action rejects claims 12-13, 89-99, 101-105 and 116-130 under the first paragraph of 35 U.S.C. 112. In particular, the office action states the claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicants disagree with the rejection and the related conclusion that the cited language constitutes new matter. However, the amendments to the claims obviate the rejection. Applicants have amended claim 12 to include different language, for example, “extracting a

trabecular pattern from the region of interest". Support for the claim language as amended can be found throughout the specification, including, without limitation, at paragraphs 51, 54, 55, 66, 68, 69 and 80.

Accordingly, the claim is described and has support in the specification, and satisfies the requirements of Section 112.

35 U.S.C. §102

The office action rejects claims 12, 89-91, 93-98-103, 118-119, and 124-130 under 35 U.S.C. 102(c) as being anticipated by U.S. Patent Number 6,442,287 (Jiang et al., hereinafter "Jiang").

Jiang does not disclose the elements of the claims as currently amended. For example, amended claim 12 describes, among other things, extracting a trabecular pattern from a region of interest and generating a data structure representing the trabecular pattern. Jiang fails to teach such a method, and instead employs a different method. As the Office Action notes on page 3 of the office action, Jiang discloses calculating texture orientation from a two-dimensional image to characterize the three-dimensional trabecular orientation. Specifically, Jiang states:

"With the present invention, texture orientation, as calculated from a projection radiograph (i.e. from a two-dimensional image), was used to characterize the three-dimensional orientation of the trabecular network."

Although the office action refers to this calculation as an "extracted structural feature[]", that referenced feature is not the same as extracting a trabecular pattern. Jiang's specification makes it clear that the calculation of texture orientation is different from the step that yields a trabecular pattern. Specifically, Jiang performs a correction to the image quality using a background trend analysis to yield a trabecular pattern. This is distinct from, and occurs prior to, the calculation of texture orientation that is referenced in the office action, as noted in the following exemplary description.

Background trend correction is performed in step S40 to yield the underlying fluctuations, i.e., the trabecular pattern, in the bone. ... Next, in step S50 the image data in the ROI are then input to a texture analysis scheme, and then, in step S60 characteristics of the bone texture are calculated. In step S70 various texture measures are calculated using texture schemes such as Minkowski Dimension, and additional information is obtained from the use of artificial neural networks (ANNs).

Furthermore, the trend correction that yields a trabecular pattern serves a purpose other than the extraction of image data. The purpose of Jiang's trend correction is to provide a "necessary" correction to remove "variation[s] in optical density [...] due to the gross anatomy of the human body (background trends) and variations due to the fine underlying texture which is related to the trabecular pattern of the bone." In other words, Jiang's trabecular pattern is the result of an overall image quality correction to the entire region of interest to remove background variations. This quality correction is not the same as extracting a trabecular bone pattern. Thus, Jiang does not disclose extracting a trabecular pattern from the region of interest as disclosed and claimed by the Applicants. (See, e.g., Application, paragraphs 50-56.)

In addition to failing to disclose the step of extracting a trabecular pattern, Jiang does not disclose the step of "generating a data structure" that represents the trabecular pattern. Thus, even if Jiang did disclose the extraction of a trabecular pattern from the region of interest as claimed, there is no further disclosure of the data structure that is generated to represent the extracted trabecular pattern.

Therefore, amended claim 12 is patentable over Jiang. Moreover, claims 89-91, 93-97, 98-103, 118-119, and 124-130, which depend from claim 12 are allowable over Jiang for at least the same reasons.

### 35 U.S.C. §103

The office action rejects claims 103, 118, and 119 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,108,635 (Herren et al., hereinafter "Herren") in view of Jiang.

As dependent claims of claim 12, claims 103, 118, and 119 include the limitations of independent claim 12. Therefore, claims 103, 118, and 119 are allowable over Jiang for at least the reasons discussed above with regard to claim 12. For example, nowhere does Herren teach or suggest extracting a trabecular pattern from the region of interest and then generating a data structure representing the trabecular pattern. Rather, Herren discloses an integrated disease information system having several modules that allow a user to project disease progression (see abstract). In particular, Herren's system uses data inputted by a user to project the disease progression. However, Herren fails to teach or suggest how the inputted data is obtained.

Accordingly, Jiang and Herren fail to teach or suggest, alone or in combination, all of the limitations of claims 103, 118, and 119, and are allowable over the combination of Jiang and Herren.

The office action rejects claims 116-117 and 120-123 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,306,822 (Kumagai et al., hereinafter "Kumagai") in view of Jiang.

As dependent claims of claim 12, claims 116-117 and 120-123 include the limitations of independent claim 12. Therefore, claims 116-117 and 120-123 are allowable over Jiang for at least the reasons discussed above with regard to claim 12. For example, nowhere does Kumagai teach or suggest extracting a trabecular pattern from the region of interest and then generating a data structure representing the trabecular pattern. Rather, Kumagai teaches a phosphopeptide and a method of treating bone disease using the phosphopeptide. Kumagai fails to teach or suggest the claimed elements.

Accordingly, Jiang and Kumagai fail to teach or suggest, alone or in combination, all of the limitations of claims 116-117 and 120-123, and the claims are allowable over the combination of Jiang and Kumagai.

The office action rejects claims 13, 92, 104-105, and 113 under 35 U.S.C. 103(a) as being unpatentable over Jiang.

As dependent claims of claim 12, claims 13, 92, 104-105, and 113 include the limitations of independent claim 12. Therefore, claims 13, 92, 104-105, and 113 are allowable over Jiang for at least the reasons discussed above with regard to claim 12. As discussed above, Jiang at a minimum fails to teach or suggest extracting a trabecular pattern from the region of interest, and generating a data structure representing the trabecular pattern, as required by claims 13, 92, 104-105 and 113. Therefore, Jiang fails to teach or suggest all of the limitations of claims 13, 92, 104-105 and 113.

The Applicants disagree with the Office Action's conclusion that these claims would have been obvious, but the rejections are obviated in light of the amendments to the claims.

Accordingly, claims 13, 92, 104-105, and 113 are allowable over Jiang.

### **CONCLUSION**

Applicants submit that the application is now in order for allowance and Applicants respectfully request that a notice of allowance be issued. Applicants believe that a three month extension of time is required and request that the associated fee be charge to deposit account number 19-4972. Applicants also request that any additional fees required by this paper be charged to or any overpayments be credited to deposit account number 19-4972. Applicant also request that the examiner contact applicant's attorney, if it will assist in processing this application through issuance.

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Respectfully submitted,

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